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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,366

06/09/2006

Tadashi Iino

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EXAMINER

PARSONS, THOMAS H

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,366	Applicant(s) IINO ET AL.	
	Examiner THOMAS H. PARSONS	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-18 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/09/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

page 4, line 33, suggest inserting “of” after “surface”.

Page 6, line 28, the text “the comprises a component” appears awkwardly worded.

Page 41, line 3, suggest changing “resent” to --present--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,884,535).

Claim 1: Saito et al. in Figure 1 discloses fuel cell separator having first (1) and second (2) surfaces, and comprising a low-elastic modulus layer (A) having a bending elastic modulus of $1.0 \times 10^1 - 6 \times 10^3$ MPa, and a bending strain of 1% or more; and a high-elastic modulus layer (B) having a bending elastic modulus exceeding 6.0×10^3 MPa, wherein the low-elastic modulus layer (A) constitutes at least a part of one or both surfaces of the separator. See entire document, in particular, col. 1: 31-42, col. 2: 53-col. 3: 40, col. 4: 28-59 and col. 6: 30-33.

Because the composition of layer 1 (carbon composite with binder) and layer 2 (carbon with a binder) is similar to that instantly disclosed, layers 1 and 2 would obviously provide a low-elastic modulus layer (A) having a bending elastic modulus of $1.0 \times 10^1 - 6 \times 10^3$ MPa, and a bending strain of 1% or more; and a high-elastic modulus layer (B) having a bending elastic modulus exceeding 6.0×10^3 MPa.

Claim 2: Saito et al. disclose that layer (A) has a thickness of 0.5 mm or less, and the layer (B) has a thickness of 0.05-2 mm. In particular, Saito et al. on col. 4: 60-67 and col. 5: 10-11 that the thickness of the coating (layer 2) is between 0.5 and 300 μm , and that the total thickness of the separator is between 0.5 and 300 μm . Therefore, the total thickness would obviously encompass the claimed thicknesses.

Claim 3: Saito et al. disclose a layer structure of layer (A)/layer (B)/layer (A) and a total thickness of 0.2-3 mm, wherein the thickness ratio (A/B) therebetween is 0.001-1.

In particular, Saito discloses a separator having a conductive coating on the surface of a base material wherein the coating imparts superior hydrophilicity and water holding property to the fuel cell. Because parallel grooves are formed on both sides of the separator and have a role in discharging water formed in the grooves (col. 1: 31-42), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a coating on both surfaces of the base material thereby a layer structure of layer (A)/layer (B)/layer (A) (i.e. layer 2/layer 1/layer 2). In addition, Saito et al. on col. 4: 60-67 and col. 5: 10-11 disclose that the thickness of the coating is 0.5 to 300 μm (.0005-.3mm) which fall within the claimed range, and obviously would provide the claimed thickness ratio.

Allowable Subject Matter

4. Claims 15-18 are allowable over the prior art references of record.
5. Claims 4-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Indicating Allowable Subject Matter

6. The following is a statement of reasons for the indication of allowable subject matter:

The claimed invention is directed toward a fuel cell separator comprising, in part, a layer (A) and/or layer (B) comprising an electroconductive resin composite material comprising 40-2 mass% of (a) resin binder, and 60-98 mass% of an electroconductive substance (b).

Saito et al. on col. 3: 66-col. 4: 9 disclose that the proportions of the components when no perishable additive is used, are, for example, 100 parts by weight of the conductive powder and 1 to 1,000 parts by weight, preferably 3 to 500 parts by weight of the binder (resin). When the proportion of the binder is less than 1 part by weight, the adhesion between the film made of the conductive coating and the base material for the separator is insufficient and the film tends to peel off. When the proportion of the binder is more than 1,000 parts by weight, the film is low not only in electrical conductivity but also in water-holding property and there may appear water droplets of such an amount that the paths for reactant gas in the separator are blocked.

Saito et al. do not teach or suggest the claimed ranges of resin binder or electroconductive substance. (*claim 4 and claims 5-14, which are dependent thereon*)

The claimed invention is directed towards a process for producing a fuel cell separator having first and second surfaces, and comprising a low-elastic modulus layer (A) having a bending elastic modulus of 1.0×10^1 - 6.0×10^3 MPa, and a bending strain of 1% or more; and a high-elastic modulus layer (B) having a bending elastic modulus exceeding 6.0×10^3 MPa, wherein the low-elastic modulus layer (A); the process comprising: molding a low-elastic modulus layer (A) and a high-elastic modulus layer (B) by at least one method selected from rolling, compression molding and stamping, to thereby provide a laminate having a groove on both sides thereof.

Saito et al. discloses molding the base material (layer B) in a separator shape (col. 4: 28-32), after which the conductive coating (layer A) is applied by casting, dip coating, spraying, brush coating, screen printing or the like).

Saito et al. do not teach or suggest molding a low-elastic modulus layer (A) and a high-elastic modulus layer (B) by at least one method selected from rolling, compression molding and stamping, to thereby provide a laminate having a groove on both sides thereof. (*claims 15 and 17-18 which are dependent thereon*)

The claimed invention is directed towards a process for producing a fuel cell separator having first and second surfaces, and comprising a low-elastic modulus layer (A) having a bending elastic modulus of 1.0×10^1 - 6.0×10^3 MPa, and a bending strain of 1% or more; and a high-elastic modulus layer (B) having a bending elastic modulus exceeding 6.0×10^3 MPa, as at least one layer constituting the surface layer, other than the low-elastic modulus layer (A); the process comprising: molding a low-elastic modulus layer (A) and a high-elastic modulus layer (B) by at least one method selected from multi-layer extruding, multi-layer injection molding,

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compression molding or rolling, to thereby provide a laminate in the form of a sheet; and forming a groove on both sides of the laminate by compression molding or stamping.

Saito et al. discloses molding the base material (layer B) in a separator shape (col. 4: 28-32), after which the conductive coating (layer A) is applied by casting, dip coating, spraying, brush coating, screen printing or the like).

Saito et al. do not teach or suggest molding a low- elastic modulus layer (A) and a high- elastic modulus layer (B) by at least one method selected from multi- layer extruding, multi-layer injection molding, compression molding or rolling, to thereby provide a laminate in the form of a sheet; and forming a groove on both sides of the laminate by compression molding or stamping.
(claim 16)

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS H. PARSONS whose telephone number is (571)272-1290. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Thomas H Parsons
Examiner
Art Unit 1795
